7: McKern A-4,5 (1920-1921) 1929 OU9 Tonga OU9

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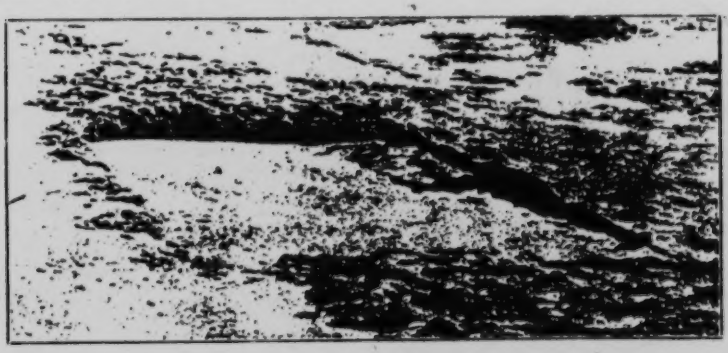

A

B

C

QUARRY SITE ON LIFUKA ISLAND: *A*, EXCAVATION FROM WHICH A LARGE STONE HAS BEEN REMOVED; *B*, GROOVES OUTLINING A STONE INTENDED FOR REMOVAL; *C*, STONES CUT FROM THE REEF.

[End Plate 1.]

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STONE CONSTRUCTION

KIND AND SOURCE OF MATERIALS

In building mounds, platforms, monuments, fortifications, walls, enclosures and miscellaneous structures, the ancient Tongans made large use of stone. The most common structures are masses of loose earth and gravel supported by retaining walls of both natural and dressed stones. Two kinds of stone were available, basalt and limestone. The basalt is on volcanic islands not conveniently near the larger, more densely populated coral islands; moreover, it is difficult to work with primitive tools. Though many native stories tell of *makahuna* (volcanic rock) brought from distant islands and extensively used, I saw only a few, small, undressed pieces of basalt forming part of the old structures. Limestone, however, is abundant, easily accessible, and presents varieties suitable for various purposes. The limestone forming the reef itself is massive, rough, compact, and without cleavage planes helpful to the mason. Though difficult to quarry, it possesses great strength and is the source of the thick long blocks needed for the largest structures. The kind of limestone commonly used (locally called "sandstone") consists of the lime sand of the beaches blown onto the shore and inland where it becomes consolidated into a stratified rock. Because it is composed of a series of superposed layers, it is easily quarried and broken into rectangular slabs suitable for retaining walls.

QUARRYING METHODS

Stone quarries are to be found at many places where suitable rock outcrops. Quarries of considerable extent were observed on the islands of Lifuka, Mango, Uiha, and Ualeva in the Haapai group, and on Motutapu and Pangaimotu in Tongatabu. The largest quarry seen is on the northeast shore of Motutapu Island, where a bed rock 50 yards in length has been exposed and intensively worked. The stone slabs obtained from the quarry were 0.7 foot to 1.5 feet in thickness. Among the largest intaglios marking the removal of slabs is one which measures 10.5 by 6.3 feet by 0.6 foot, another, 10 by 6 feet by 0.6 foot, and a third, 9 by 8 feet by 1 foot. On some slabs, quarrying had been begun but not completed. The information obtained from these remnants of unfinished work regarding the successive stages of operations coincides exactly with that gathered from living informants.

The procedure was as follows. An area of desired size and shape was marked out on the rock surface. Large axes (*toki lahi*), fashioned of basalt and finished with faces tapering abruptly away from a blunt edge, were then employed to cut a groove around this outlined area. This groove was carried

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down until a natural plane of lateral cleavage was reached. Wooden poles were then used as levers to lift the loose slab from its bed, and other poles were slipped under the slab across the cavity formed by the removal of the stone. Skid poles were placed transversely across the path over which the stone was destined to move, and the slab was started on its way to the building site by means of tug-ropes and unstinted cooperative man power. Levers were used at places where progress became exceptionally difficult. The process of hauling stones overland over skidways was called *makafunualoto;* the officer in charge was called *mailau.* A quarry site on Lifuka Island, Haapai, is shown in Plate I.

TRANSPORTATION OF STONE

Stone structures were found on islands where no quarries could be located, and stone quarries on islands where there are no stone structures. That large stones were carried over considerable water distances is evidenced by the fact that no stone structures, aside from one small burial cist, was found on Motutapu or on any neighboring island closer than Tongatabu, whereas stones 6 feet wide and 10 feet long have been removed from the Motutapu quarries.

Living informants give the following account, remembered from the testimony of the preceding generation, of how stones were taken from one island to another:

> The boats, at first the *tungiaki* and later the *kalia,* were large double-hulled sailing vessels, bridged with spacious decks, quite capable of carrying heavy loads. The vessel was brought as near to the shore as possible without running the risk of grounding, and there anchored to stakes set up on the shore. The anchoring place was usually at the very edge of a coral shelf, extending outward from the main shoreline, which was submerged at high tide and comparatively dry at low tide. The stone was dragged over skids to the edge of this coral shelf. Heavy wooden poles were then placed each with one end on the deck of the vessel and the other end crossing the abrupt edge of the coral shelf. These served as skids over which the stone was dragged onto the deck, where it was carefully adjusted and balanced, then tied by many ropes radiating from the stone to various parts of the vessel. In removing the stone from the vessel the reverse order was used. Some of the smaller stones were carried by groups of men, selected for their great strength, who placed the stones on the decks of the vessels without the aid of skids.

Certain traditions credit a large vessel named *Lomipeau* with bringing stones to Tongatabu from Uvea (Wallis) Island, for use in the construction of Telea's tomb, *Paepaeotelea* (p. 51). The boat is described as being so large that its hulls passed on either side of the island of Hungatonga, while the deck swept over the tops of the trees. As all the stones in Telea's tomb are coral limestone whereas Uvea is a volcanic island, it seems that the only possible element of truth in this legend is that some of the stones used in the structure may have been brought from other islands.

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The following descriptions include all of the pigeon mounds which a thorough survey of the island could discover. The accuracy of the names cannot be vouched for, as they were supplied by a single informant, the only man found who professed to have any knowledge of the names. Three mounds, Nos. 8, 9, and 10, are classed as pigeon mounds because closely associated with structures known to be pigeon mounds. Native informants were of the opinion that they were used by the pigeon snarers in some capacity, possibly as temporary dwelling sites for the chiefs engaged in the sport. They are like the pigeon mounds which they neighbor except for the absence of any trace of a central pit or basin.

2. Finevalafililolo, in central southern Ualeva, Type II (fig. 6).

Finevalafililolo is composed of a mixture of sand and earth. The centrally placed pit has retaining walls of dressed rectangular slabs of coral stone averaging 3.5 feet in length, 0.7 foot in thickness and standing 2 feet out of the ground. The flat floor of the basin is of earth. The mound is surrounded at irregular intervals by ten funnel-shaped pits averaging 10 feet in depth and 25 to 30 feet in diameter, situated from 25 to 75 feet from the mound base. They are said to have furnished the earth from which the mound is constructed.

3. Siaulufotu, at the south end of Ualeva Island, Type II (fig. 7).

The sloping sides of Siaulufotu are surfaced with stone work consisting of an inner base of rough, loosely piled fragments and an outer coating intact only in places, of rectangular, roughly dressed slabs laid flat, their edges fitting together haphazardly (fig. 7, *c*). These slabs are 2 to 6 feet long, 1.5 to 4 feet wide and 0.3 foot to 0.5 foot thick. The largest slab in place measures 6 by 4 feet by 0.5 foot. The central depression is surrounded by rectangularly dressed slabs of stone averaging slightly more than 3 feet in length, 0.6 foot in thickness, and which stand 2 feet above ground and 1 foot below the bottom of the flat earthen floored basin. A steeply inclined dirt roadway from the northwest leading to the top of the mound is paved with rough stones of varying sizes, their flat sides turned upward to make a comparatively smooth surface.

Siaulufotu is entirely surrounded by a ditch or series of connected pits, 30 feet wide and 12 feet deep, which stands 40 to 50 feet from the mound base. It is thought to have furnished earth for the construction of the mound. Near the northernmost base of the mound is a flat bottomed well called Vaisioata (Water-mirror). Its walls are of loose, roughly piled stone and slant outward from the base at an angle of about 15° from the perpendicular. The rim of the well is 8 feet in diameter and the depth 3 feet, of which 1 foot is under water. The bottom appears to be partly filled with loose debris. About 50 feet east of the mound was found a quarry site where stone for the structure may have been obtained. At this place about a foot of surface soil had been removed, exposing coral "sandstone" which has been cut through in a way to suggest the removal of rectangular slabs.

4. Unnamed mound, Ualeva Island, Type II.

This mound consists of a circular pile of earth with a horizontally flat top. It is 3 to 4 feet high and has a base diameter of 82 feet and a top diameter of 72 feet. The earthen floor of the basin is horizontally flat. Its sides are supported by dressed rectangular slabs of stone practically all the same size, about 3 feet long, 0.6 foot thick, and 2 feet out of the ground. Several large funnel-shaped excavations near the mound probably indicate the source of material for the construction.

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agreed to build something to be called the Haamonga in-after time that should not be destroyed. In the beginning of the work it was portioned out, foreign groups sharing it, Rotuma, Futuna, Uvea, Niua Fo'ou and Niua Toputapu and Samoa. Three stones were cut, two placed upright, earth heaped up between them till it was level with their tops, and the third pushed up, and put in place. Then the earth was removed and used for little platforms *(sia)* where Tui-ta-tui was buried; but the Haamonga stood for a sight."[14]

The position of the trilithon suggests a gateway to the royal compound Heketa. Scattered about are relics of the ancient kings. At one point is the *Maka Fakinanga*, a large upright slab, which, as its name "the Stone to lean against" implies, served as a back rest for the king when he sat down on the little stone-faced mound in one side of which it is set. Hard by are two stone-faced house platforms, one of a single, and the other of three tiers. The blocks are excellently worked, being much superior in finish to the generality of the old Tongan stone monuments. The house which stood on the larger of these platforms had stone posts, well shaped, and with niches at the top to carry the roof beams. They are there today, cast down, alas, and broken. A man who is cultivating Heketa, and acts as a sort of caretaker of the historic spot, says that they were intact till quite recent years. Those who believe that the origin of the trilithon is to be found in the skies may see significance in the fact that the name of Orion's Belt in Samoan is *Amonga*. From this slight hint it is easy to construct a theory of a structure of religious, or astronomical, import, perhaps due to direct Samoan influence, whose name, become unintelligible to later centuries, was altered into an understandable form. A theory of this sort has a certain fascination, but I know of nothing to support it.

In regard to the general question of whence these, and the other large stones used in the burial vaults of the kings, *langi*, were obtained, there is no *a priori* reason why most, if not all, should not have been cut out of the Tongan reefs. They are coral limestone, and fairly large pieces are cut from the reefs to-day for burial vaults. So far as I am aware, however, nobody has seen places on the reefs whence

14. I am indebted to Mr. E. W. Gifford for a copy of this manuscript.

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the very large stones used in the old structures have been quarried; but, on the other hand, no systematic search may have been made. Traditionary evidence, however, is sufficiently strong to warrant the belief that some at least of the stones were brought from distant islands, notably Uvea.

All these imposing structures are incontrovertible evidence of power. They were possible only to kings at whose command was a practically unlimited supply of labour. The population of the islands may have been little, if any, greater, than at present, but the king must have had the unquestioned right to the labour of every man. The fragment quoted above indicates such a right extending over a very much larger area than the present Tongan group. Despotic power can accomplish much. A tradition relates that two chiefs, brothers, were engaged in hauling a huge stone, which the labourers found quite beyond their strength. Night fell, but the stone had not been moved. In the darkness the brothers took counsel together, and, when the work was resumed on the morrow, threatened with death any man who did not pull satisfactorily. The threat was efficacious, and "the stone ran" into its place, as the Tongan idiom has it.

REMOVAL OF KINGS TO MUA.

The two sons of Tui-ta-tui initiated an important change. They were interested in boats, and each possessed a large canoe. Heketa was ill-provided with anchorages, and they shifted their abode nearer to the centre of the north coast of Tongatabu, to the present Mua, or Lapaha (equivalent to Lambasa in Fiji), where they found safe shelter for their boats. Henceforth this site was the abode of the Tui Tonga and his court. Here are the *langi*, burial vaults, so well known to the modern sight-seer. These vaults stand in a long row, with isolated ones scattered about. The earliest probably dates from about the thirteenth century. The finest of these, with corners of immense single blocks hewn into right angles, stands nearer the sea than the main row of *langi*. It is associated with the name of Telea, who belongs to about the beginning of the seventeenth century; but its position suggests the probability that its erection belongs to the reign of an earlier king. There have been very recent interments in this *langi*. It should be remarked that highly competent Tongan authority asserts that the kings

764 for the *Tu'i Tonga* and high-ranking members of his
766 family. The majority of the *langi* were built on
349 Tongatapu in the village of Mu'a, which was for many years the center of Tongan culture and where today there exist the remains of many of the
349 impressive stone monuments. In general, the term *langi* implies a structure consisting of one or more terraces made of large, rectangular slabs of coral sandstone or limestone. However, *langi* were reportedly only earthen mounds at first, and then during the reign of the *Tu'i Tonga* Tu'itatui in the eleventh century, stone structures were erected to serve as royal tombs.[10]

316 As huge stones for a *langi* had to be quarried,
324 transported and then constructed at the appropriate location, a tremendous amount of cooperation, time, workmanship and communal labor were
[643] necessary. In Tonga, this was made possible by the rigid organization of the socio-political system under the *Tu'i Tonga*, who could command highly organized labor and discipline from his subjects.

[p. 30-B]

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Ha'ateiho is the place where three London Missionary Society missionaries were killed in 1799. At Bea may be seen the spot where Captain Croker was killed and three naval guns were captured in 1840.

There is a good example of an old fort in fair preservation at Hule, near Nukunuku. The most remarkable of the numerous trenches of the island is known as the Keli-'a-Belehake, which extends from Vaotu'u to Nukunuku, Te'ekiu, Masilamea, and back to the southern coast at Fahefa; tradition states that this was actually dug in a single night during a war between the men of Hahake and those of Hihifo led by Vaha'i, at some undetermined time probably in the early 19th century. The name of a hamlet, 'Umutagata, also in the western district, recalls a rare instance of human cremation and cannibalism.

At Kolovai there is the enclosure where the former Tu'i Kanokubolu were invested with office; a piece of the koka tree under which these kings sat has been placed in the modern coronation chair at Nuku'alofa. The tombs of these kings are also at Kolovai. This village is well-known to tourists as a sanctuary for great numbers of flying-foxes.

Houma, on the south-west coast, is noted for the blow-holes which extend along the cliffs for a considerable distance.

In the extreme north-west of the island, at Ha'atafu, a monument stands to mark the landing-place of the first Wesleyan missionaries (1826). Tasman in 1643 and Cook in 1773 also landed nearby.

Navigation lights now stand at Ha'atafu, Nuku'alofa and Malinoa, an island north of Nuku alofa. The quarantine station is situated at Makaha'a, another island off Nuku'alofa.

Ancient stone-quarries are to be seen at Motutabu and Bagaimotu, small islands not far from Nuku'alofa. It seems more than probable that the stones used in the great tombs (lagi) at Mu'a and elsewhere were cut at these places, and certainly not at Uvea and other distant islands to which old native traditions refer.

HA'ABAI. It is considered that this name is derived from Savai'i, the island in Samoa from which the ancient Tongans probably came. Ha'abai is a scattered archipelago of small islands, the total area of which is less than that of 'Eua, if the uninhabited volcanic islands of Tofua and Kao are excluded. Yet these islets support a population of 6,410, most of whom have small tax-allotments or none at all, and despite the difficulties of getting a livelihood—difficulties which hurricanes and droughts have increased in recent years—the number of people who have gone to take up land in Togatabu and Vava'u is not considerable. The people of Ha'abai have always been renowned as skilful navigators and fishermen.

The Governor of Ha'abai resides at Bagai, Lifuka, which was also the boyhood home and always the favourite residence of Tubou I. Cook was entertained at a great festival and a plot was made against his life on this island in 1777. Mariner's vessel, the "Port-au-Prince," was also attacked here, and the cemetery of the murdered sailors is at Koulo, Lifuka.

Uoleva, now uninhabited, has a remarkable number of pigeon-mounds used by chiefs in ancient times, also an old sunken road of unknown use extending through the island.